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ABSTRACT

This report summarizes the theoretic background, rationale, and development of 14 simulated cases useful in comparing the problem-solving behaviors of clinicians as they diagnose the same case under the same conditions and in supplementing field experiences in teacher preparation programs. The first section of the report presents a theoretic structure, the Inquiry Theory, which focuses on the intellectual encounter. The second section explains the reasons that necessitate using simulated cases instead of human subjects. The five-step procedure to evolve a simulated case is outlined in the third section: creation of a research and development team, identification of a human subject exhibiting target difficulties, review and refinement of the case following data collection, categorization and computer coding of all edited information, and final review of the case and recommendations for diagnosis and remediation. The fourth section describes current uses of simulated cases, and the last two sections suggest future uses of simulated cases and dissemination procedures. A list of simulated cases developed in 1977-78 describing general characteristics and present status is included. (AEA)

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SIMULATED READING AND LEARNING DISABILITY CASES: EFFECTIVE TOOLS FOR RESEARCH AND TEACHER EDUCATION

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Joel VanRoekel, and Lawrence Lezotte

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Simulated Reading and Learning Disability Cases: Effective Tools for Research and Teacher Education

Linda Patriarca, Joel VanRoekel, and Lawrence Lezotte[1]

Studies of clinical problem solving in reading and learning disabilities can be facilitated through use of simulated cases. These simulated cases allow researchers to compare the problem-solving behaviors of clinicians, as they diagnose the same case under the same conditions, which obviously is not possible using live cases. Also, simulated cases used to supplement field experiences in teacher preparation programs can provide students preparing to be remedial specialists with much more diagnostic and remedial experience than would be possible using only live cases.

Researchers in IRT's Clinical Studies Program have developed a number of simulated cases in both reading and learning disabilities which are valuable in research, teacher preparation, and teacher inservice education. But before we describe further the uses of simulated cases, we will discuss their theoretic background, the rationale behind them, how they are developed and exactly what they are.

Theoretic Background

Researchers at Michigan State University have developed a formal theoretic structure to study the procedures clinicians follow and the conclusions they come to while diagnosing a client (Elstein, Shulman, & Sprafka, 1978). This structure, known as the Inquiry Theory (Vinsonhaler, Wagner, & Elstein, Note 1), is based on the concept of *clinical encounter*.

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A clinical encounter is defined as the set of events that take place when a clinician attempts to identify the problems which need to be addressed in a given case. (For our purposes, a case is a simulated case.)

The Inquiry Theory attempts to predict aspects of the clinical encounter which are recurrent -- that is, those features which recur when several clinicians interact with the same simulated case, or when a single clinician interacts with several simulated cases. Because the encounter between clinician and case is such an important aspect of this theory, the manner in which the concept of simulated case is defined and used is of fundamental importance. We define a simulated case as:

> The data base available to the clinician for diagnostic and therapeutic decision making regarding a particular client. This data base consists of a list of cue names (referring to specific tests, work assignments, etc.) and cue values (the corresponding test scores, work samples, etc.) at a particular point in time.

It should be noted that the data base gathered for each case focuses on the *intellectual aspects* of the clinical encounter. Because the cases are simulated, the various factors of the affective interaction between clinician and case must be excluded. Data on the social/emotional aspects of the client in question are however, included in each simulated case by means of teacher anecdotal records, behavior checklists, and a taped interview, among other things.

Rationale for Developing Simulated Cases

Because the Inquiry Theory attempts to describe the events that occur between two human beings -- a clinician and a client -- the cases used to study this theory should simulate as closely as possible "real world" conditions. One might logically wonder, then, why simulation is necessary, and why we do not study this theory using real subjects rather that simulated subjects.

There are several reasons why the use of humans as subjects or cases is problematic. First, federal regulations regarding the use of human subjects do not permit testing and retesting of the same individual. Thus, researchers cannot observe what behaviors recur among clinicians assessing the same case. Second, to achieve a scientifically acceptable level of objectivity, the case must be replicable. This is not possible with human cases because identical behaviors cannot be maintained over a number of clinical encounters. Finally, to continually seek out and use human subjects whose problems fit the above criteria would be an extremely time consuming, expensive, and often frustrating task -- one with a high probability of failure. Yet, for purposes of research and teacher preparation, a large number of cases representing a variety of conditions and backgrounds is considered highly desirable. For these reasons, the Inquiry Theory rests on the principle that cases based on the performance of human beings may be effectively simulated through the provision of sets of information provided to the clinician. Friedman (1973) and DeDombal, Horrocks, Champ, and Storr (1974) support this notion by stating that significant features of clinical problem solving can be taught or, in this case, investigated, without the need for human interaction between client and clinician.

Simulated Case Development: Process and Product

Our development of simulated cases has become a fairly well regulated process since November 1976, when a set of basic procedures was first implemented. A simulated case is a collection of data (e.g., test scores, protocols) which simulates a case of specific reading or learning disability problems. The evolution of a simulated case is a complex and technical five-step procedure occuring over a period of months:

1. A research and development team is created, including at least one senior researcher, senior clinician, research assistant, and clerical keysetter. The researchers determine the collection of problems to be included in the case (i.e., word recognition difficulties, visual motor problems, etc.).

2. A human subject exhibiting these difficulties is sought. Once found, the necessary permission forms are filed, an extensive assessment workup is conducted, and data is collected. Although the data collected for each case may vary somewhat in accordance with the unique nature of each child's problems, all cases include such standard information as: biographical data, physical/health/family data, school records, achievement tests, ability tests, and diagnostic reading tests. In addition to the broad range of data available, a variety of specific types of information may be requested for each individual bit of data. To illustrate, the vertical column in Table 1 represents the range of data which may be requested; the horizontal column represents the specific type of data which may be requested.

Table 1: Cue Inventory

Durrell Analysis of Reading Difficulty

	Test Scores	Examiners' comments	Test booklet	Audio record	Test directions
Oral Reading	DUR 101	DUR 201	DUR 301	DUR 701	DUR 501
Silent Reading	DUR 102	DUR 202	DUR 302		DUR 502
Listening Comp.	DUR 103	DUR 203	DUR 303		DUR 503

3. Following data collection, the case is reviewed thoroughly and refined, if necessary. The concept of case refinement simply refers to that process whereby information is deleted, disguised, modified, emphasized, or added in order to sharpen the contours of the case. For example, a taped interview with the child may be shortened and spliced if it is too lengthy for practical use, and all identifying references to the child (name, address, teacher's names, etc.) are deleted or altered.

4. All edited information is then categorized and coded to be put into a computer. The computer allows for the use of two different case formats in the clinical encounter. A computer-based simulated case may be presented through the use of a terminal or minicomputer. All information concerning the case, with the exception of test protocols (provided in a supplementary text), are presented on paper printouts or some kind of screen. The manually-based simulated case is designed to be presented to a clinician by another individual, an experimenter. The experimenter initiates the encounter between the clinician and the case by presenting the "Initial Contacts," which include an artist's sketch of the child, a written introduction explaining why this child was referred, and a recorded interview between the child and examiner. A "Cue Inventory" (list of all available cues) (see Table 1) is then presented to the clinician. In the manually-based format, all materials are stored in metal cases and must be retrieved by the experimenter.

5. Once both forms of the case are complete, all data records are reviewed by experts in the particular field represented by the case (reading or learning disabilities). Upon completion of this review procedure, several senior clinicians are asked to interact with the case, and write a diagnosis and plan for remediation. During this process, the clinicians are encouraged to provide feedback on the types of material available to them and on the specific data found in the case. If the case is judged by the experts and clinicians to be satisfactory, it is ready for use in clinical problem solving. To date, a number of simulated cases are available for use in such research. These cases represent a diverse range of ages, background, achievement levels, and problems (see ~~Table 2~~ Figure).

Current Uses of Simulated Cases

To date, our simulated cases have been used primarily to study how clinicians faced with a client exhibiting particular symptoms will set about the process of problem solving to arrive at a written diagnosis and remediation plan. Studies falling into this category have been labeled observational studies because the research focus is to observe, capture, and later reflect upon each clinician's process of diagnosis (i.e., what information they request, in what order, etc.) as well as their final product (i.e., the written diagnosis and remedial plan). These studies are described by Gil, Hoffmeyer, VanRoekel, and Weinshank (Note 2). Our cases have also been used, although to a much lesser extent, in our research on the applicability of simulated cases in the preparation of teachers. This research, most appropriately labeled Application Studies, sought to determine:

Figure: Simulated Cases Developed 1977-78

SIMULATED CASE	DIRECTING CLINICIAN	GENERAL CHARACTERISTICS *	PRESENT STATUS
77/1	Sherman MSU	White, male, age 8.6 years, 3rd grade, middle class family background.	Manual & computer based versions available from IRT with suggested diagnoses.
77/2	Sherman MSU	Equivalent form of the above case; i.e., same problems, different child.	Manual & computer based versions available from IRT with suggested diagnoses.
77/3	Bader MSU	White, male, age 11.4 years, 6th grade, middle class family background.	Manual & computer based versions available from IRT with suggested diagnoses.
77/4	Bader MSU	Equivalent form of the above case; i.e., same problems, different child.	Manual & computer based versions available from IRT with suggested diagnoses.
77/5	Sherman MSU	White, male, age 9 years, 4th grade, middle class family background.	Manual & computer based versions available from IRT with suggested diagnoses.
77/6	Sherman MSU	Equivalent form of the above case; i.e., same problems, different child.	Manual & computer based versions available from IRT with suggested diagnoses.
77/7	Sherman MSU	White, male, age 11 years, 6th grade, lower-middle class family background.	Manual & computer based versions available from IRT with suggested diagnoses.
77/8	Sherman MSU	Equivalent form of the above case; i.e., same problems, different child.	Manual & computer based versions available from IRT with suggested diagnoses.
78/1	Patriarca MSU Lerner UNI	White, female, age 8.8 years, 4th grade, middle class family background, learning disability problem.	Completed - Manual & computer based versions completed.
78/2	Barr U.C.	Black, male, age 12 years, 5/6th grade, lower-middle class family background.	Completed as above.
78/3	Barr U.C.	Minority female, age 10 years, 5th grade, bilingual, lower-middle class.	Completed as above.
78/5	Barr U.C.	Minority female, age 8 years, 3rd grade, bilingual, lower-middle class.	Completed as above.
78/5	Barr U.C.	Minority female, age 7 years, 2nd grade, lower-middle class.	Completed as above.
79/6	Sherman MSU	White male, age 16 years, lower class family.	Completed as above.

*The cases include reading problems representative of those experienced in most classrooms.

1. Whether teachers could be better prepared as diagnosticians using these simulated cases as tools for diagnosis.

2. Whether the fundamental relationship between clinical memory and clinical performance predicted from the inquiry theory of medicine (Elstein, Shulman, & Sprafka, 1978) would also apply to the field of reading (i.e., would an increase in diagnostic performance be accompanied by increases in diagnostic memory? (Sherman, Note 3)).

Future Uses of Simulated Cases

Simulated cases have proven their worth as research tools and therefore will continue to be used in IRT's Clinical Studies Research Program. In all likelihood, research will continue to expand into new areas involving clinician judgments. The properties of simulated cases which free them from the constraints of time, place, and, to an extent, content, make them valuable research tools.

Simulated cases have several properties that may make them equally valuable as effective tools for teacher education. Simulated cases can be used in both pre- and inservice training of students in fields involving clinical judgments. For example, preservice training experiences can be enriched by simulated cases because a single student, by using them, can experience a wide variety of cases. Because of the simulated cases' properties, students can work on the cases at a time and rate which suits them. Students can work with cases with only minimal orientation, and minimal supervision. In addition, the simulated case format protects human subjects from unnecessary exploitation and eliminates the

potentially dangerous problem of personal harm to clients through erroneous diagnosis.

The clinical problem-solving process exhibited by a student working with a simulated case provides a permanent and objective record of problem-solving processes, thus facilitating an instructor's ability to pin-point weaknesses and strengths and give a student necessary and appropriate feedback and assistance.

In a similar way, simulated cases could be used for inservice training for practicing clinicians. For example, experienced clinicians might find it enlightening to review the diagnostic process using a case with known properties and an established record of diagnosis. This experience itself could serve as a "refresher course" for clinicians, as simulated cases could provide objective feedback to a clinician selecting such inservice experiences.

In clinical fields which require special licenses or certification, simulated cases could provide a vehicle through which objective and reliable measures of clinical problem-solving competencies can be assessed. With the proper assessment specifications, simulated cases could be used as one of the bases for issuing or renewing professional credentials.

Disseminating Simulated Cases

The Institute for Research on Teaching is anxious to make simulated cases available for use as research or instructional tools. Currently, the Institute has 10 different cases. (four cases have equivalent forms, bringing the total to 13) that can be made available to other researchers for a small fee to cover the cost of materials. The IRT staff would like to maintain records of how the simulated cases are used in both research

and instructional settings. Feedback from such uses will allow us to design better simulated cases and describe any limitations of the current set.

Inquiries about the acquisition of one or more of the simulated cases can be directed to the Coordinator of Dissemination Programs, Institute for Research on Teaching, Michigan State University, East Lansing, Michigan, 48824.

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